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April 20, 2011

VIA CERTIFIED MAIL

Mr. Ross del Rosario
Ms. Leslie Patterson
Ms. Sheila Sullivan

Remedial Project Managers
USEPA, Region 5
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

RE: Multi-Site Risk Assessment Framework Addendum - Former Manufactured Gas Plant Sites
-North Shore Gas Co. CERCLA Docket No. V-W-07-C-877
-Peoples Gas Light and Coke Co. CERCLA Docket No. V-W-08-C-917
-Wisconsin Public Service Corp. CERCLA Docket No. V-W-06-C-847 (WI Multi-Site)

Dear Ms. Patterson, Mr. del Rosario, and Ms. Sullivan:

Please find enclosed an addendum to the USEPA-approved 2007 Multi-Site Risk Assessment Framework (RAF) document for the former manufactured gas plant sites of Wisconsin Public Service Corporation, Peoples Gas Light and Coke Company, and North Shore Gas Company.

This RAF addendum incorporates the following changes referenced in recent USEPA comment letters as well as our December 17, 2010 technical meeting:

- The hierarchy for the human health screening levels have been updated to incorporate the regional screening levels (RSLs; U.S. EPA 2010) that were not included in the original RAF hierarchy; and
- Vapor intrusion screening values, which were not presented in the original RAF, are incorporated in this addendum.

Please do not hesitate to contact me at (312) 240-4569 if you have any questions regarding this document.

Sincerely,

Naren Prasad

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Senior Environmental Engineer

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Technical Memorandum
April 14, 2011

Risk Assessment Framework Addendum

This document represents an addendum to the human health risk screening values originally presented in the multi-site risk assessment framework (RAF) for former manufactured gas plant sites (MGPs), prepared for Wisconsin Public Service Corporation, Peoples Gas Light and Coke Company, and North Shore Gas Company (Exponent 2007). The human health screening levels have been updated to incorporate the regional screening levels (RSLs; U.S. EPA 2010) that the U.S. Environmental Protection Agency (EPA) developed after the RAF was approved. The EPA RSLs have become the standard screening levels for the initial screening step in human health risk assessments. In addition, vapor intrusion screening values, which were not presented in the RAF, are incorporated in this addendum. The vapor intrusion screening levels are based on the RSLs and were estimated using EPA guidance (U.S. EPA 2002). Use of the RSLs and elements of this addendum were discussed in a technical exchange meeting between EPA and Integrys, and their respective consultants, on December 17, 2010.

This addendum also reflects changes in State (Illinois or Wisconsin) risk-based screening levels issued since the RAF was developed. A separate list of screening levels is provided for Wisconsin and Illinois sites to reflect the differences between State regulations.

Screening levels for MGP-related contaminants of potential concern presented in Table 1 of the RAF are summarized by medium within this document. On a site-specific basis, if other non-MGP-related analytes require consideration, human health screening values will be developed for those analytes using the processes specified in this addendum.

The human health screening values will be updated as the sources of the screening values presented in this document are updated (e.g., when new versions of the RSLs become available). The updates of the screening values will be reflected in site-specific documents rather than revisions to this addendum.

Hierarchy Used to Develop Human Health Screening Values

Human health screening values are provided for soil, groundwater ingestion, and vapor intrusion-related media (i.e., indoor air, soil gas, and groundwater) in this addendum. A hierarchical approach was used to select human health screening levels by analyte within each medium. When a screening value is available from the highest tier source, values from lower tier sources are not used.

Hierarchy for All Media other than Ingestion of Groundwater — The RSL values are used as the first-tier source of screening levels for soil and indoor air, and as the basis for the vapor intrusion–related screening levels (i.e., soil gas and groundwater). For Illinois sites, State risk-based screening criteria are used as a second-tier (and sometimes third-tier) source of screening values to fill gaps where RSLs are not available. For Wisconsin sites, the State is transitioning to using RSLs as the basis of screening criteria for soil and vapor intrusion–related media

(indoor air and soil gas), as discussed further below; therefore, no second-tier screening criteria are used for soil or vapor intrusion–related media.

Hierarchy for Groundwater Ingestion — For the groundwater ingestion screening levels, the hierarchy begins with the lower of the federal (i.e., maximum contaminant levels [MCLs], U.S. EPA 2009) and State-promulgated drinking water standards. The tap-water RSLs are used as a second tier when drinking-water standards are not available for an analyte. As discussed in Section 5.2 of the RAF, these groundwater ingestion screening values will be compared to site groundwater concentrations to assess the potential risk if groundwater were to be used as a drinking-water source. The groundwater screening evaluation will be used only to determine whether concentrations of groundwater contaminants occur at levels that present a potential risk. The results of the groundwater screening will be documented in the risk assessment. It is anticipated that the potential risk associated with groundwater will be assessed in the feasibility study, and if potential risks are present, they may be mitigated using risk management tools and/or remediation.

Media-Specific Human Health Screening Values

The methods used to develop and select the screening values by medium are presented in this section.

Soil Screening Values

Soil screening values were selected separately for residential and industrial/commercial land use. For simplicity, the industrial/commercial screening values are labeled simply as "industrial" screening values within this document and in the associated tables. The soil screening levels for Wisconsin are presented in Tables 1 and 2, and the soil screening levels for Illinois are presented in Tables 3 and 4.

For Wisconsin sites, the RSLs were used to develop the list of soil screening values, because an RSL value was available for each analyte that currently has a Wisconsin soil standard under NR 720 (WDNR 2007), thus eliminating any need to use a second-tier source. At present, the Wisconsin Department of Natural Resources (WDNR) has a proposal in front of the State Legislature to overhaul the process used to set risk-based soil standards. The proposed approach would adopt soil-based screening values that are similar in nature to the RSLs and would be derived using the toxicity and chemistry data used to derive the RSLs. For this reason, applying the soil RSLs as screening values to Wisconsin sites appears to address both EPA and WDNR requirements. The soil screening levels based on the RSLs are presented in Table 1 (residential) and Table 2 (industrial).

The RSLs for each analyte are developed based on a target cancer risk of one in one million (1×10^{-6}) for carcinogenic chemicals, or a target hazard quotient of one (1) for chemicals that elicit only noncancer effects (e.g., liver toxicity). Conservative default exposure assumptions that reflect either residential exposure or industrial worker exposure to soil are used along with the target risk factors and toxicity values to estimate the RSLs. When a chemical has the

potential to cause cancer and noncancer toxicity effects, the lower of the two endpoint-specific values is used as the RSL. However, it should be noted that some RSLs were developed using information on carcinogenicity from the California Environmental Protection Agency (Cal-EPA), which is not generally applied in other EPA regions (e.g., Region 5, which includes Wisconsin and Illinois). Two specific MGP-related constituents (naphthalene and ethylbenzene) are classified as carcinogens by Cal-EPA, so the RSLs provided in the standard look-up table are based on the cancer endpoint. These Cal-EPA cancer-based values are presented in Table 1 for information purposes. However, because EPA Region 5 currently bases risk assessments for these two chemicals on noncancer effects, screening levels based on noncancer effects are also presented in Tables 1–4 and have been adopted as the preferred screening criteria for these two analytes. In the future, if there is a change in policy within EPA Region 5 that affects the process for risk assessment of these two analytes, it will be addressed at that time. This paradigm for selecting naphthalene and ethylbenzene screening values will be applied in both states and across all media.

The soil screening values for Illinois sites are presented in Tables 3 and 4. The first tier of the soil screening hierarchy for Illinois sites relies on the RSLs as described for Wisconsin sites. When an RSL was not available, a tiered approach to corrective action (TACO) soil criterion developed by the Illinois Environmental Protection Agency (IEPA) was used. The most current promulgated TACO values were used (IEPA 2007). TACO criteria are developed for residential, commercial workers, and construction workers. However, construction-worker TACO values were not used in the hierarchy, because they were derived using exposure assumptions very different from those used to derive commercial TACO and RSL screening values. The lowest of the available residential TACO criteria (ingestion or inhalation routes) were used as the residential screening value when an RSL was not available. The lowest of the available commercial worker TACO criteria (ingestion or inhalation routes) were used as the screening values for workers when an industrial RSL was not available.

If neither an RSL nor a TACO value were available, then a non-TACO value was used as the screening value, if available. Non-TACO values are developed by IEPA using provisional toxicity values, but are not promulgated soil standards within Illinois. The most current non-TACO values available were used (January 6, 2009; IEPA 2009). The selection of residential and commercial/industrial non-TACO values followed the same scheme as that developed for TACO values (i.e., the lowest of available residential or commercial/industrial values was used).

Groundwater Screening Values

For establishing groundwater screening values for sites within either Wisconsin or Illinois, the same general tiered process is followed. The first tier of screening values is defined by the lower of the federal drinking-water standard (i.e., MCL [U.S. EPA 2009]) and the State regulation-specific groundwater standard. If no promulgated drinking-water standard was available from federal or State sources, then the tap-water RSL was used as the second-tier source of screening values.

For Wisconsin sites, the first tier of the groundwater hierarchy is the lower of the MCL and the Wisconsin NR 140 Enforcement Standard (WDNR 2010a). For Illinois sites, the first tier of the

groundwater hierarchy was the lower of the MCL and the Illinois Tier I groundwater remediation objective. If there was also no tap-water RSL, then for Illinois sites, the Illinois non-TACO groundwater remediation objective was used as a third tier in the Illinois hierarchy (IEPA 2009). The selected groundwater screening values and their sources are summarized by state in Tables 5 and 6.

Indoor Air Screening Values

Indoor air screening values were selected separately for residential and industrial land use.

Indoor air RSLs were used as the screening values for both Wisconsin and Illinois sites. These screening values will be used for indoor air investigations where the potential for vapor intrusion into a building exists based on subsurface soil or groundwater contamination associated with former MGP-related operations. The indoor air RSLs are summarized in Tables 7–12 for both residential and industrial properties. The EPA indoor air RSLs are used for both Wisconsin and Illinois MGP sites, because at this time, Illinois has no promulgated indoor air risk-based screening values, and Wisconsin adopted the indoor air RSLs as their source of risk-based indoor air screening values in their recently published vapor intrusion guidance (WDNR 2010b).

Vapor Intrusion Screening Values for Soil Gas and Groundwater

The vapor intrusion screening values for soil gas and groundwater were derived by back-calculating screening values using the indoor air RSLs (residential or industrial) as a target concentration, combined with a medium-specific (i.e., soil gas or groundwater)-to-building attenuation factor. The methods for the calculations follow those specified in EPA's subsurface vapor intrusion guidance (U.S. EPA 2002). While the methods for developing the vapor intrusion screening values presented in the U.S. EPA (2002) guidance are still considered applicable, the original vapor intrusion screening values for soil gas and groundwater in this document are outdated and do not reflect current toxicity and environmental chemistry data. Therefore, the vapor intrusion screening values were updated using the procedures in U.S. EPA (2002) combined with the most current toxicity and chemistry data reflected in the latest version of the RSL documentation and reflected in the indoor air RSLs (U.S. EPA 2010).

The vapor intrusion screening values for shallow soil gas (subslab to less than 5 ft deep), deep soil gas (5 ft or deeper), and groundwater are presented in Tables 7–12. Only vapor intrusion screening values for compounds that are both sufficiently volatile and have an inhalation toxicity value are summarized in these tables. Those compounds considered sufficiently volatile were determined based on their categorization in the RSL table as "volatile." The two criteria used to determine whether an analyte is volatile are the chemical's molecular weight and its volatility, as discussed in more detail in the RSL documentation. The chemical's volatility is determined using the dimensionless Henry's Law constant. Both parameters are presented in the RSL documentation. The presence or absence of an inhalation toxicity value was also determined using the toxicity information presented in the RSL documentation.

The attenuation factors listed below were used for derivation of the soil gas and groundwater vapor intrusion screening values.

- Shallow Soil Gas 0.1
- Deeper Soil Gas 0.01
- Groundwater 0.001

These values reflect the current default values presented in U.S. EPA (2002), and were selected by EPA Region 5 specifically for use in deriving the vapor intrusion screening values within this addendum. These attenuation factors are currently under review by EPA headquarters, but are considered reasonably conservative for purposes of developing the initial vapor intrusion screening values.

If, on a site-specific basis, other less conservative attenuation factors appear appropriate, they will be used to update the initial vapor intrusion screening analysis. One such possible site-specific instance might be when evaluating vapor intrusion for a large building for which specific criteria are met (e.g., increased size of building, thickness of floor, and greater air exchange rate). In such a situation, an alternative set of attenuation factors might be incorporated if site-specific building characteristics can justify the use of less conservative (i.e., lower) attenuation factors. For example, WDNR has incorporated this flexibility in their current approach within the vapor intrusion guidance (WDNR 2010b) for large commercial buildings where the building factors listed above (e.g., building size) are documented and can be used to substantiate the use of lower attenuation factors. In the case of the Wisconsin vapor intrusion guidance, a 10-fold lower attenuation factor is applied to the default attenuation factors presented above to address the increased attenuation that occurs within larger buildings. Such alternative vapor intrusion evaluations will be communicated to EPA on a site-specific basis, and the justification for their application will be documented in the remedial investigation work plan.

Soil gas screening values are calculated using the following equation:

$$\text{Soil gas screening value } (\mu g/m^3) = \text{Indoor air RSL } (\mu g/m^3) / \text{Soil gas attenuation factor (dimensionless)}$$

Groundwater vapor intrusion screening values are calculated using the following equation:

$$\text{Groundwater vapor intrusion screening value } (\mu g/L) = \text{Indoor air RSL } (\mu g/m^3) * [1/\text{Groundwater attenuation factor}] * [1/\text{Henrys Law constant (dimensionless)}] * 0.001 \text{ conversion factor } (m^3/L)$$

In U.S. EPA (2002) guidance, vapor intrusion screening values are presented for multiple target cancer risk levels (i.e., 10^{-6}, 10^{-5}, and 10^{-4}). The document includes an analogous set of vapor intrusion screening tables for soil gas and groundwater representing cancer risks of 10^{-6} (Tables 7 and 10), 10^{-5} (Table 8 and 11), and 10^{-4} (Tables 9 and 12). When developing these three sets of values, vapor intrusion screening values for those analytes that are not classified as carcinogens are represented by a target hazard quotient of one (1) in all tables. For those analytes that can cause both carcinogenic and noncancer effects (e.g., benzene), the lower of the

cancer- and noncancer-based screening values are presented in the screening tables. As the cancer risk goal increases from 10^{-6} to 10^{-5} and then to 10^{-4}, some of the selected vapor intrusion screening levels switch from cancer-based screening levels to noncancer-based screening levels. For example, at the 10^{-4} cancer risk level, the cancer-based value for benzene for deep soil gas is 16,000 $\mu g/m^3$. However, the screening level based on noncancer effects using a target hazard quotient of 1 is 3,100 $\mu g/m^3$. Therefore, the noncancer-based screening value of 3,100 $\mu g/m^3$ is used, rather than the higher cancer-based value.

Other conventions adopted based on U.S. EPA (2002) guidance within the vapor intrusion screening table are as follows:

- If the calculated vapor intrusion soil gas screening level exceeded its maximum chemical vapor-phase concentration, the maximum vapor-phase concentration was used to represent the calculated soil gas screening value
- If the calculated groundwater vapor intrusion screening-level concentration exceeded the solubility for the pure chemical, the chemical solubility was used (designated by "sol" to the right of the screening value)
- If the calculated groundwater vapor intrusion screening level exceeded the MCL, the MCL was used.

Cumulative Risk Check for Noncancer Effects

The screening values presented in this addendum for soil, indoor air, soil gas, and vapor migration from groundwater will be used as the first step in the human health screening process within the baseline risk assessment.[1] For each analyte, the maximum observed concentration will be compared to the screening level to determine whether it should be carried forward into the baseline risk assessment as a chemical of potential concern (COPC) for further evaluation. The noncancer-based screening values are based on a hazard quotient of one, which is the accepted cumulative risk criterion for noncancer effects at a site under EPA risk assessment guidelines.

If a situation arises where no noncancer COPCs are selected based on the initial screening evaluation, then an additional check will be performed to determine whether exposure to the multiple chemicals identified at the site will result in the exceedance of the cumulative noncancer risk target (i.e., a hazard index of one). The process to perform this check is depicted in Figure 1.

To perform the check, the maximum concentration of each non-carcinogenic chemical detected at the site will be divided by its media-specific screening level, and then these individual ratios (i.e., hazard quotients) will be summed across all non-carcinogens detected at the site. If the sum of the hazard quotients results in a hazard index exceeding the value of 1, then those

[1] Formal risk calculations for groundwater ingestion will not be performed in the baseline risk assessment, so the special conditions discussed in this section do not apply for this exposure pathway.

chemicals responsible for the exceedance will be carried forward for further evaluation within the baseline risk assessment.

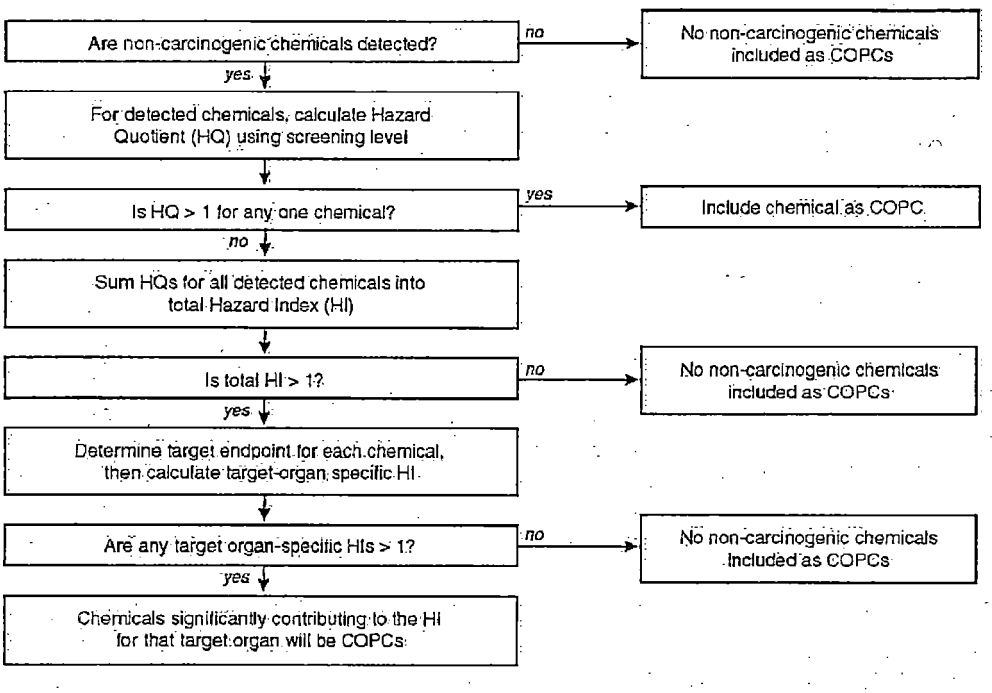

Figure 1. Screening check for cumulative non-carcinogenic effects

MY03195.006 0105 02[illegible]

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WDNR. 2010a. Chapter NR 140. Groundwater quality. Wisconsin Administrative Code Register, December 2010, No. 660. Wisconsin Department of Natural Resources.

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Table 1. Residential soil selected screening values (Wisconsin)

Analyte	CAS #	Selected Risk-Based Concentration Soil Residential (mg/kg)	Source	Comments for Selected Value	U.S. EPA 2010 RSL Soil Residential (mg/kg)
Semivolatile Organic Compounds					
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	83-32-9	3,400 n	RSL		3,400 n
Acenaphthylene	208-96-8	3,400 n	RSL	Used surrogate of Acenaphthene (83-32-9)	3,400 n
Anthracene	120-12-7	17,000 n	RSL		17,000 n
Benzo(a)anthracene	56-55-3	0.15 c	RSL		0.15 c
Benzo(a)pyrene	50-32-8	0.015 c	RSL		0.015 c
Benzo(b)fluoranthene	205-99-2	0.15 c	RSL		0.15 c
Benzo(g,h,i)perylene	191-24-2	1,700 n	RSL	Used surrogate of Pyrene (129-00-0)	1,700 n
Benzo(k)fluoranthene	207-08-9	1.5 c	RSL		1.5 c
Chrysene	218-01-9	15 c	RSL		15 c
Dibenz(a,h)anthracene	53-70-3	0.015 c	RSL		0.015 c
Fluoranthene	206-44-0	2,300 n	RSL		2,300 n
Fluorene	86-73-7	2,300 n	RSL		2,300 n
Indeno(1,2,3-cd)pyrene	193-39-5	0.15 c	RSL		0.15 c
2-Methylnaphthalene	91-57-6	310 n	RSL		310 n
Naphthalene (cancer)	91-20-3	3.6 c*	RSL		3.6 c*
Naphthalene (non-cancer)	91-20-3	140 n	RSL[a]	Used only IRIS-based non-cancer values	140 n
Phenanthrene	85-01-8	17,000 n	RSL	Used surrogate of Anthracene (120-12-7)	17,000 n
Pyrene	129-00-0	1,700 n	RSL		1,700 n
Phenols					
2,4-Dimethylphenol	105-67-9	1,200 n	RSL		1,200 n
3&4-Methylphenol (m&p)	106-44-5	310 n	RSL	Used value for p-cresol (106-44-5)	310 n
2-Methylphenol (o-Cresol)	95-48-7	3,100 n	RSL		3,100 n
Phenol	108-95-2	18,000 n	RSL		18,000 n
Volatile Organic Compounds					
Benzene	71-43-2	1.1 c*	RSL		1.1 c*
Ethylbenzene (cancer)	100-41-4	5.4 c	RSL		5.4 c
Ethylbenzene (non-cancer)	100-41-4	3,500 n	RSL[a]	Used only IRIS-based non-cancer values	3,500 n
2-Methylnaphthalene	91-57-6	310 n	RSL		310 n
Toluene	108-88-3	5,000 ns	RSL		5,000 ns
1,2,4-Trimethylbenzene	95-63-6	62 n	RSL		62 n
1,3,5-Trimethylbenzene	108-67-8	780 ns	RSL		780 ns
m&p-Xylene	106-42-3	3,400 ns	RSL	Used value for p-xylene (106-42-3)	3,400 ns
o-Xylene	95-47-6	3,800 ns	RSL		3,800 ns
Xylene (Total)	1330-20-7	630 ns	RSL		630 ns
Metals and Inorganics					
Aluminum	7429-90-5	77,000 n	RSL		77,000 n
Antimony	7440-36-0	31 n	RSL	Antimony (metallic)	31 n
Arsenic	7440-38-2	0.39 c*	RSL	Arsenic, Inorganic	0.39 c*
Barium	7440-39-3	15,000 n	RSL		15,000 n
Cadmium	7440-43-9	70 n	RSL	Dietary value	70 n
Chromium	7440-47-3	120,000 nm	RSL	Used value for Cr(III)	120,000 nm
Copper	7440-50-8	3,100 n	RSL		3,100 n
Iron	7439-89-6	55,000 n	RSL		55,000 n
Lead	7439-92-1	400 n	RSL	Lead and Compounds	400 n
Manganese	7439-96-5	1,800 n	RSL	Used non-dietary value	1,800 n
Mercury	7487-94-7	23 n	RSL	Used Hg Chloride (& other Hg salts) (7487-94-7)	23 n
Nickel	7440-02-0	1,500 n	RSL	Nickel Soluble Salts	1,500 n
Selenium	7782-49-2	390 n	RSL		390 n
Silver	7440-22-4	390 n	RSL		390 n
Vanadium	7440-62-2	390 n	RSL	Used Vanadium and Compounds	390 n
Zinc	7440-66-6	23,000 n	RSL	Zinc (Metallic)	23,000 n
Cyanide	57-12-5	1,600 n	RSL	Cyanide (CN-)	1,600 n

Notes:

This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources that are described in the text. The source of the selected screening value is presented to the right of the numerical value.

Hierarchy for soil screening criteria:

RSLs

RSLs

U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.

n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1

c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 1,000,000

c* – where the non-cancer screening level is < 100× cancer screening level

c** – where the non-cancer screening level < 10× cancer screening level

m – Concentration may exceed ceiling limit

s – Concentration may exceed Csat (soil saturation concentration)

Table 2. Industrial soil selected screening values (Wisconsin)

Analyte	CAS #	Selected Risk-Based Concentration Soil Industrial (mg/kg)	Source	Comments for Selected Value	U.S. EPA 2010 RSL Soil Industrial (mg/kg)
Semivolatile Organic Compounds					
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	83-32-9	33,000 n	RSL		33,000 n
Acenaphthylene	208-96-8	33,000 n	RSL	Used surrogate of Acenaphthene (83-32-9)	33,000 n
Anthracene	120-12-7	170,000 nm	RSL		170,000 nm
Benzo(a)anthracene	56-55-3	2.1 c	RSL		2.1 c
Benzo(a)pyrene	50-32-8	0.21 c	RSL		0.21 c
Benzo(b)fluoranthene	205-99-2	2.1 c	RSL		2.1 c
Benzo(g,h,i)perylene	191-24-2	17,000 n	RSL	Used surrogate of Pyrene (129-00-0)	17,000 n
Benzo(k)fluoranthene	207-08-9	21 c	RSL		21 c
Chrysene	218-01-9	210 c	RSL		210 c
Dibenz(a,h)anthracene	53-70-3	0.21 c	RSL		0.21 c
Fluoranthene	206-44-0	22,000 n	RSL		22,000 n
Fluorene	86-73-7	22,000 n	RSL		22,000 n
Indeno(1,2,3-cd)pyrene	193-39-5	2.1 c	RSL		2.1 c
2-Methylnaphthalene	91-57-6	4,100 ns	RSL		4,100 ns
Naphthalene (cancer)	91-20-3	18 c*	RSL		18 c*
Naphthalene (non-cancer)	91-20-3	620 n	RSL[a]	Used only IRIS-based non-cancer values	620 n
Phenanthrene	85-01-8	170,000 nm	RSL	Used surrogate of Anthracene (120-12-7)	170,000 nm
Pyrene	129-00-0	17,000 n	RSL		17,000 n
Phenols					
2,4-Dimethylphenol	105-67-9	12,000 n	RSL		12,000 n
3&4-Methylphenol (m&p)	106-44-5	3,100 n	RSL	Used value for p-cresol (106-44-5)	3,100 n
2-Methylphenol (o-Cresol)	95-48-7	31,000 n	RSL		31,000 n
Phenol	108-95-2	180,000 nm	RSL		180,000 nm
Volatile Organic Compounds					
Benzene	71-43-2	5.4 c*	RSL		5.4 c*
Ethylbenzene (cancer)	100-41-4	27 c	RSL		27 c
Ethylbenzene (non-cancer)	100-41-4	21,000 n	RSL[a]	Used only IRIS-based non-cancer values	21,000 n
2-Methylnaphthalene	91-57-6	4,100 ns	RSL		4,100 ns
Toluene	108-88-3	45,000 ns	RSL		45,000 ns
1,2,4-Trimethylbenzene	95-63-6	260 ns	RSL		260 ns
1,3,5-Trimethylbenzene	108-67-8	10,000 ns	RSL		10,000 ns
m&p-Xylene	106-42-3	17,000 ns	RSL	Used value for p-xylene (106-42-3)	17,000 ns
o-Xylene	95-47-6	19,000 ns	RSL		19,000 ns
Xylene (Total)	1330-20-7	2,700 ns	RSL		2,700 ns
Metals and Inorganics					
Aluminum	7429-90-5	990,000 nm	RSL		990,000 nm
Antimony	7440-36-0	410 n	RSL	Antimony (metallic)	410 n
Arsenic	7440-38-2	1.6 c	RSL	Arsenic, Inorganic	1.6 c
Barium	7440-39-3	190,000 nm	RSL		190,000 nm
Cadmium	7440-43-9	800 n	RSL	Dietary value	800 n
Chromium	7440-47-3	1,500,000 nm	RSL	Used value for Cr(III)	1,500,000 nm
Copper	7440-50-8	41,000 n	RSL		41,000 n
Iron	7439-89-6	720,000 nm	RSL		720,000 nm
Lead	7439-92-1	800 n	RSL	Lead and Compounds	800 n
Manganese	7439-96-5	23,000 n	RSL	Used non-dietary value	23,000 n
Mercury	7487-94-7	310 n	RSL	Used Hg Chloride (& other Hg salts) (7487-94-7)	310 n
Nickel	7440-02-0	20,000 n	RSL	Nickel Soluble Salts	20,000 n
Selenium	7782-49-2	5,100 n	RSL		5,100 n
Silver	7440-22-4	5,100 n	RSL		5,100 n
Vanadium	7440-62-2	5,200 n	RSL	Used Vanadium and Compounds	5,200 n
Zinc	7440-66-6	310,000 nm	RSL	Zinc (Metallic)	310,000 nm
Cyanide	57-12-5	20,000 n	RSL	Cyanide (CN-)	20,000 n

Notes:

This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources that are described in the text. The source of the selected screening value is presented to the right of the numerical value.

Hierarchy for soil screening criteria:

RSLs

RSLs

U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.

n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1

c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 1,000,000

c* – where the non-cancer screening level is < 100× cancer screening level

c** – where the non-cancer screening level < 10× cancer screening level

m – Concentration may exceed ceiling limit

s – Concentration may exceed Csat (soil saturation concentration)

Table 3. Residential soil selected screening values (Illinois)

Analyte	CAS #	Selected Risk-Based Concentration: Soil Residential (mg/kg)	Source	Comments for Selected Value	U.S. EPA 2010 RSL Soil Residential (mg/kg)	IEPA 2007 TACO Remediation Objective Soil, Residential: Ingestion (mg/kg)	IEPA 2007 TACO Remediation Objective Soil, Residential: Inhalation (mg/kg)	IEPA 2009 Non-TACO Remediation Objective Soil, Residential: Ingestion (mg/kg)	IEPA 2009 Non-TACO Remediation Objective Soil, Residential: Inhalation (mg/kg)
Semivolatile Organic Compounds									
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	83-32-9	3,400 n	RSL		3,400 n	4,700 n	--	--	--
Acenaphthylene	208-96-8	3,400 n	RSL	Used surrogate of Acenaphthene (83-32-9)	3,400 n	--	--	2,300 n	--
Anthracene	120-12-7	17,000 n	RSL		17,000 n	23,000 n	--	--	--
Benzo(a)anthracene	56-55-3	0.15 c	RSL		0.15 c	0.9 c,w	--	--	--
Benzo(a)pyrene	50-32-8	0.015 c	RSL		0.015 c	0.09 c,w	--	--	--
Benzo(b)fluoranthene	205-99-2	0.15 c	RSL		0.15 c	0.9 c,w	--	--	--
Benzo(g,h,i)perylene	191-24-2	1,700 n	RSL	Used surrogate of Pyrene (129-00-0)	1,700 n	--	--	2,300 n	--
Benzo(k)fluoranthene	207-08-9	1.5 c	RSL		1.5 c	9 c	--	--	--
Chrysene	218-01-9	15 c	RSL		15 c	88 c	--	--	--
Dibenz(a,h)anthracene	53-70-3	0.015 c	RSL		0.015 c	0.09 c,w	--	--	--
Fluoranthene	206-44-0	2,300 n	RSL		2,300 n	3,100 n	--	--	--
Fluorene	86-73-7	2,300 n	RSL		2,300 n	3,100 n	--	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	0.15 c	RSL		0.15 c	0.9 c,w	--	--	--
2-Methylnaphthalene	91-57-6	310 n	RSL		310 n	--	--	--	--
Naphthalene (cancer)	91-20-3	3.6 c*	RSL		3.6 c*	1,600 n	170 n	--	--
Naphthalene (non-cancer)	91-20-3	140 n	RSL[a]	Used only IRIS-based non-cancer values	140 n	1,600 n	170 n	--	--
Phenanthrene	85-01-8	17,000 n	RSL	Used surrogate of Anthracene (120-12-7)	17,000 n	--	--	2,300 n	--
Pyrene	129-00-0	1,700 n	RSL		1,700 n	2,300 n	--	--	--
Phenols									
2,4-Dimethylphenol	105-67-9	1,200 n	RSL		1,200 n	1,600 n	--	--	--
2-Methylphenol (o-Cresol)	95-48-7	3,100 n	RSL		3,100 n	3,900 n	--	--	--
3&4-Methylphenol (m&p)	106-44-5	310 n	RSL	Used value for p-cresol (106-44-5)	310 n	--	--	390 n	--
Phenol	108-95-2	18,000 n	RSL		18,000 n	23,000 n	--	--	--
Volatile Organic Compounds									
Benzene	71-43-2	1.1 c*	RSL		1.1 c*	12 c	0.8 c	--	--
Ethylbenzene (cancer)	100-41-4	5.4 c	RSL		5.4 c	7,800 n	400 d	--	--
Ethylbenzene (non-cancer)	100-41-4	3,500 n	RSL[a]	Used only IRIS-based non-cancer values	3,500 n	7,800 n	400 d	--	--
2-Methylnaphthalene	91-57-6	310 n	RSL		310 n	--	--	--	--
Toluene	108-88-3	5,000 ns	RSL		5,000 ns	16,000 n	650 d	--	--
1,2,4-Trimethylbenzene	95-63-6	62 n	RSL		62 n	--	--	--	87 n
1,3,5-Trimethylbenzene	108-67-8	780 ns	RSL		780 ns	--	--	3,900 n	46 n
m&p-Xylene	106-42-3	3,400 ns	RSL	Used value for p-xylene (106-42-3)	3,400 ns	16,000 n	460 d	--	--
o-Xylene	95-47-6	3,800 ns	RSL		3,800 ns	16,000 n	410 d	--	--
Xylene (Total)	1330-20-7	630 ns	RSL		630 ns	16,000 n	320 d	--	--
Metals and Inorganics									
Aluminum	7429-90-5	77,000 n	RSL		77,000 n	--	--	78,000 n	1,000,000 n
Antimony	7440-36-0	31 n	RSL	Antimony (metallic)	31 n	31 n	--	--	--
Arsenic	7440-38-2	0.39 c*	RSL	Arsenic, inorganic	0.39 c*	-- t	750 c	--	--
Barium	7440-39-3	15,000 n	RSL		15,000 n	5,500 n	690,000 n	--	--
Cadmium	7440-43-9	70 n	RSL	Dietary value	70 n	78 n	1,800 c	--	--
Chromium	7440-47-3	120,000 nm	RSL	Used value for Cr(III)	120,000 nm	230 n	270 c	--	--
Copper	7440-50-8	3,100 n	RSL		3,100 n	2,900 n	--	--	--
Iron	7439-89-6	55,000 n	RSL		55,000 n	--	--	55,000 n	--
Lead	7439-92-1	400 n	RSL	Used value for lead and compounds	400 n	400 n	--	--	--
Manganese	7439-96-5	1,800 n	RSL	Used non-dietary value	1,800 n	1,600 n,v	69,000 n	--	--
Mercury	7487-94-7	23 n	RSL	Used Hg Chloride (& other Hg salts) (7487-94-7)	23 n	--	--	--	--
Nickel	7440-02-0	1,500 n	RSL	Nickel Soluble Salts	1,500 n	1,600 n	13,000 c	--	--
Selenium	7782-49-2	390 n	RSL		390 n	390 n	--	--	--
Silver	7440-22-4	390 n	RSL		390 n	390 n	--	--	--
Vanadium	7440-62-2	390 n	RSL	Used Vanadium and Compounds	390 n	550 n	--	--	--
Zinc	7440-66-6	23,000 n	RSL	Zinc (Metallic)	23,000 n	23,000 n	--	--	--
Cyanide	57-12-5	1,600 n	RSL	Cyanide (CN-)	1,600 n	1,600 n	--	--	--

(footnotes on following page)

Table 3. Residential soil selected screening values (Illinois)

Notes:

This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources that are described in the text. The source of the selected screening value is presented to the right of the numerical value.

Hierarchy for soil screening criteria:

RSL, then TACO, then non-TACO value.

For all TACO and non-TACO soil remediation objectives, the lowest of the two pathway-specific (i.e., ingestion or inhalation) values was used.

RSLs

U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

TACO and non-TACO

Illinois Tiered Approach to Corrective Action (TACO), soil remediation objectives, Title 35 Part 742 (IEPA 2007) (http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.asp)

Illinois non-TACO objectives (IEPA 2009) (http://www.epa.state.il.us/land/taco/chemicals-not-in-taco-tier-1-tables.html)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.

n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1

c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 1,000,000

c* – where the non-cancer screening level is < 100× cancer screening level

c** – where the non-cancer screening level < 10× cancer screening level

d – Soil saturation concentration (C[sat]) – the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.

m – Concentration may exceed ceiling limit

s – Concentration may exceed Csat

t – For the ingestion route for arsenic, see 742.Appendix A, Table G [Concentrations of Inorganic Chemicals in Background Soils]

v – Value based on Reference Dose adjusted for dietary intake

w – For sites located in any populated area as defined in Section 742.200, Appendix A, Table H may be used [Concentrations of Polynuclear Aromatic Hydrocarbon Chemicals in Background Soils]

Table 4. Industrial soil selected screening values (Illinois)

Analyte	CAS #	Selected Risk-Based Concentration Soil Industrial (mg/kg)	Source	Comments for Selected Value	U.S. EPA 2010 RSL Soil Industrial (mg/kg)	IEPA 2007 TACO Remediation Objective Soil, Industrial Ingestion (mg/kg)	IEPA 2007 TACO Remediation Objective Soil, Industrial Inhalation (mg/kg)	IEPA 2009 Non-TACO Remediation Objective Soil, Industrial Ingestion (mg/kg)	IEPA 2009 Non-TACO Remediation Objective Soil, Industrial Inhalation (mg/kg)
Semivolatile Organic Compounds									
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	83-32-9	33,000 n	RSL		33,000 n	120,000 n	--	--	--
Acenaphthylene	208-96-8	33,000 n	RSL	Used surrogate of Acenaphthene (83-32-9)	33,000 n	--	--	61,000 n	--
Anthracene	120-12-7	170,000 nm	RSL		170,000 nm	610,000 n	--	--	--
Benzo(a)anthracene	56-55-3	2.1 c	RSL		2.1 c	8 c	--	--	--
Benzo(a)pyrene	50-32-8	0.21 c	RSL		0.21 c	0.8 c,x	--	--	--
Benzo(b)fluoranthene	205-99-2	2.1 c	RSL		2.1 c	8 c	--	--	--
Benzo(g,h,i)perylene	191-24-2	17,000 n	RSL	Used surrogate of Pyrene (129-00-0)	17,000 n	--	--	61,000 n	--
Benzo(k)fluoranthene	207-08-9	21 c	RSL		21 c	78 c	--	--	--
Chrysene	218-01-9	210 c	RSL		210 c	780 c	--	--	--
Dibenz(a,h)anthracene	53-70-3	0.21 c	RSL		0.21 c	0.8 c	--	--	--
Fluoranthene	206-44-0	22,000 n	RSL		22,000 n	82,000 n	--	--	--
Fluorene	86-73-7	22,000 n	RSL		22,000 n	82,000 n	--	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	2.1 c	RSL		2.1 c	8 c	--	--	--
2-Methylnaphthalene	91-57-6	4,100 ns	RSL		4,100 ns	--	--	--	--
Naphthalene (cancer)	91-20-3	18 c*	RSL		18 c*	41,000 n	270 n	--	--
Naphthalene (non-cancer)	91-20-3	620 n	RSL[a]	Used only IRIS-based non-cancer values	620 n	41,000 n	270 n	--	--
Phenanthrene	85-01-8	170,000 nm	RSL	Used surrogate of Anthracene (120-12-7)	170,000 nm	--	--	61,000 n	--
Pyrene	129-00-0	17,000 n	RSL		17,000 n	61,000 n	--	--	--
Phenols									
2,4-Dimethylphenol	105-67-9	12,000 n	RSL		12,000 n	41,000 n	--	--	--
2-Methylphenol (o-Cresol)	95-48-7	31,000 n	RSL		31,000 n	100,000 n	--	--	--
3&4-Methylphenol (m&p)	106-44-5	3,100 n	RSL	Used value for p-cresol (106-44-5)	3,100 n	--	--	10,000 n	--
Phenol	108-95-2	180,000 nm	RSL		180,000 nm	610,000 n	--	--	--
Volatile Organic Compounds									
Benzene	71-43-2	5.4 c*	RSL		5.4 c*	100 c	1.6 c	--	--
Ethylbenzene (cancer)	100-41-4	27 c	RSL		27 c	200,000 n	400 d	--	--
Ethylbenzene (non-cancer)	100-41-4	21,000 n	RSL[a]	Used only IRIS-based non-cancer values	21,000 n	200,000 n	400 d	--	--
2-Methylnaphthalene	91-57-6	4,100 ns	RSL		4,100 ns	--	--	--	--
Toluene	108-88-3	45,000 ns	RSL		45,000 ns	410,000 n	650 d	--	--
1,2,4-Trimethylbenzene	95-63-6	260 ns	RSL		260 ns	--	--	--	140 n
1,3,5-Trimethylbenzene	108-67-8	10,000 ns	RSL		10,000 ns	--	--	100,000 n	73 n
m&p-Xylene	106-42-3	17,000 ns	RSL	Used value for p-xylene (106-42-3)	17,000 ns	410,000 n	460 d	--	--
o-Xylene	95-47-6	19,000 ns	RSL		19,000 ns	410,000 n	410 d	--	--
Xylene (Total)	1330-20-7	2,700 ns	RSL		2,700 ns	410,000 n	320 d	--	--
Metals and Inorganics									
Aluminum	7429-90-5	990,000 nm	RSL		990,000 nm	--	--	1,000,000 n	1,000,000 n
Antimony	7440-36-0	410 n	RSL	Antimony (metallic)	410 n	820 n	--	--	--
Arsenic	7440-38-2	1.6 c	RSL	Arsenic, Inorganic	1.6 c	-- t	1,200 c	--	--
Barium	7440-39-3	190,000 nm	RSL		190,000 nm	140,000 n	910,000 n	--	--
Cadmium	7440-43-9	800 n	RSL	Dietary value	800 n	2,000 n	2,800 c	--	--
Chromium	7440-47-3	1,500,000 nm	RSL	Cr(III) for soil	1,500,000 nm	6,100 n	420 c	--	--
Copper	7440-50-8	41,000 n	RSL		41,000 n	82,000 n	--	--	--
Iron	7439-89-6	720,000 nm	RSL		720,000 nm	--	--	1,000,000 n	--
Lead	7439-92-1	800 n	RSL	Lead and Compounds	800 n	800 n	--	--	--
Manganese	7439-96-5	23,000 n	RSL	Used non-dietary value	23,000 n	41,000 n,w	91,000 n	--	--
Mercury	7487-94-7	310 n	RSL	Used Hg Chloride (& other Hg salts) (7487-94-7)	310 n	--	--	--	--
Nickel	7440-02-0	20,000 n	RSL	Nickel Soluble Salts	20,000 n	41,000 n	21,000 c	--	--
Selenium	7782-49-2	5,100 n	RSL		5,100 n	10,000 n	--	--	--
Silver	7440-22-4	5,100 n	RSL		5,100 n	10,000 n	--	--	--
Vanadium	7440-62-2	5,200 n	RSL	Used Vanadium and Compounds	5,200 n	14,000 n	--	--	--
Zinc	7440-66-6	310,000 nm	RSL	Zinc (Metallic)	310,000 nm	610,000 n	--	--	--
Cyanide	57-12-5	20,000 n	RSL	Cyanide (CN-)	20,000 n	41,000 n	--	--	--

(footnotes on following page)

Table 4. Industrial soil selected screening values (Illinois)

Notes:
This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources that are described in the text. The source of the selected screening value is presented to the right of the numerical value.

Hierarchy for soil screening criteria:
RSL, then TACO, then non-TACO value.
For all TACO and non-TACO soil remediation objectives, the lowest of the two pathway-specific (i.e., ingestion or inhalation) values was used.

RSLs
U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

TACO and non-TACO
Illinois Tiered Approach to Corrective Action (TACO), soil remediation objectives, Title 35 Part 742 (IEPA 2007) (http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.asp)
Illinois non-TACO objectives (IL EPA 2009) (http://www.epa.state.il.us/land/taco/chemicals-not-in-taco-tier-1-tables.html)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.
n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1
c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 1,000,000
c* – where the non-cancer screening level is < 100× cancer screening level
c** – where the non-cancer screening level < 10× cancer screening level
d – Soil saturation concentration (C[sat]) – the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.
m – Concentration may exceed ceiling limit
s – Concentration may exceed Csat
t – For the ingestion route for arsenic for industrial/commercial, see 742.Appendix A, Table G [Concentrations of Inorganic Chemicals in Background Soils]
w – Value based on reference dose adjusted for dietary intake
x – For any populated areas as defined in Section 742.200, Appendix A, Table H may be used [Concentrations of Polynuclear Aromatic Hydrocarbon Chemicals in Background Soils]

Table 5. Groundwater ingestion selected screening values (Wisconsin)

Analyte	CAS #	Selected Risk-Based Concentration: Groundwater Residential (µg/L)	Source	Comments for Selected Value	U.S. EPA 2009 Maximum Contaminant Level (µg/L)	WI NR140 Groundwater Enforcement Standard (µg/L)	U.S. EPA 2010 RSL Tapwater (µg/L)
Semivolatile Organic Compounds							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	83-32-9	2,200 n	RSL		--	--	2,200 n
Acenaphthylene	208-96-8	2,200 n	RSL	Used surrogate of Acenaphthene (83-32-9)	--	--	2,200 n
Anthracene	120-12-7	3,000	NR140		--	3,000	11,000 n
Benzo(a)anthracene	56-55-3	0.029 c	RSL		--	--	0.029 c
Benzo(a)pyrene	50-32-8	0.2	MCL/NR140		0.2	0.2	0.0029 c
Benzo(b)fluoranthene	205-99-2	0.2	NR140		--	0.2	0.029 c
Benzo(g,h,i)perylene	191-24-2	1,100 n	RSL	Used surrogate of Pyrene (129-00-0)	--	--	1,100 n
Benzo(k)fluoranthene	207-08-9	0.29 c	RSL		--	--	0.29 c
Chrysene	218-01-9	0.2	NR140		--	0.2	2.9 c
Dibenz(a,h)anthracene	53-70-3	0.0029 c	RSL		--	--	0.0029 c
Fluoranthene	206-44-0	400	NR140		--	400	1,500 n
Fluorene	86-73-7	400	NR140		--	400	1,500 n
Indeno(1,2,3-cd)pyrene	193-39-5	0.029 c	RSL		--	--	0.029 c
2-Methylnaphthalene	91-57-6	150 n	RSL		--	--	150 n
Naphthalene (cancer)	91-20-3	100	NR140		--	100	0.14 c*
Naphthalene (non-cancer)	91-20-3	100	NR140	Used only IRIS-based non-cancer values	--	100	6.2 n
Phenanthrene	85-01-8	11,000 n	RSL	Used surrogate of Anthracene (120-12-7)	--	--	11,000 n
Pyrene	129-00-0	250	NR140		--	250	1,100 n
Phenols							
2,4-Dimethylphenol	105-67-9	730 n	RSL		--	--	730 n
3&4-Methylphenol (m&p)	106-44-5	180 n	RSL	Used value for p-cresol (106-44-5)	--	--	180 n
2-Methylphenol (o-Cresol)	95-48-7	1,800 n	RSL		--	--	1,800 n
Phenol	108-95-2	2,000	NR140		--	2,000	11,000 n
Volatile Organic Compounds							
Benzene	71-43-2	5	MCL/NR140		5	5	0.41 c
Ethylbenzene (cancer)	100-41-4	700	MCL/NR140		700	700	1.5 c
Ethylbenzene (non-cancer)	100-41-4	700	MCL/NR140	Used only IRIS-based non-cancer values	700	700	1,300 n
2-Methylnaphthalene	91-57-6	150 n	RSL		--	--	150 n
Toluene	108-88-3	800	NR140		1,000	800	2,300 n
1,2,4-Trimethylbenzene	95-63-6	15 n	RSL		--	--	15 n
1,3,5-Trimethylbenzene	108-67-8	370 n	RSL		--	--	370 n
m&p-Xylene	106-42-3	1,200 n	RSL	Used value for p-xylene (106-42-3)	--	--	1,200 n
o-Xylene	95-47-6	1,200 n	RSL		--	--	1,200 n
Xylene (Total)	1330-20-7	2,000	NR140		10,000	2,000	200 n
Metals and Inorganics							
Aluminum	7429-90-5	37,000 n	RSL		--	--	37,000 n
Antimony	7440-36-0	6	MCL/NR140	Antimony (metallic)	6	6	15 n
Arsenic	7440-38-2	10	MCL/NR140	Arsenic, Inorganic	10	10	0.045 c
Barium	7440-39-3	2,000	MCL/NR140		2,000	2,000	7,300 n
Cadmium	7440-43-9	5	MCL/NR140		5	5	18 n
Chromium	7440-47-3	100	MCL/NR140	Cr (total)	100	100	55,000 n
Copper	7440-50-8	1,300	MCL/NR140		1,300	1,300	1,500 n
Iron	7439-89-6	26,000 n	RSL		--	--	26,000 n
Lead	7439-92-1	15	MCL/NR140	Lead and Compounds	15	15	--
Manganese	7439-96-5	300	NR140	Used non-dietary value	--	300	880 n
Mercury	7487-94-7	2	MCL/NR140	Used Hg Chloride (& other Hg salts) (7487-94-7)	2	2	11 n
Nickel	7440-02-0	100	NR140	Nickel Soluble Salts	--	100	730 n
Selenium	7782-49-2	50	MCL/NR140		50	50	180 n
Silver	7440-22-4	50	NR140		--	50	180 n
Vanadium	7440-62-2	30	NR140	Used Vanadium and Compounds	--	30	180 n
Zinc	7440-66-6	11,000 n	RSL	Zinc (Metallic)	--	--	11,000 n
Cyanide	57-12-5	200	MCL/NR140	Cyanide (CN-)	200	200	730 n

(footnotes on following page)

Table 5. Groundwater ingestion selected screening values (Wisconsin)

Notes:
This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources that are described in the text. The source of the selected screening value is presented to the right of the numerical value.

Hierarchy for groundwater ingestion screening criteria:
Minimum of MCL or WI NR140 value, then RSL-tapwater.
For the groundwater screening value, the notation of "MCL/NR140" indicates that both values were the same.

MCLs:
Maximum Contaminant Levels (MCL) national primary drinking water standards (U.S. EPA 2009) (http://water.epa.gov/drink/contaminants/index.cfm)

WI NR140
WI NR 140 groundwater quality enforcement standards published in Register 660, dated December 2010 (http://legis.wisconsin.gov/rsb/code/nr/nr140.pdf)

RSLs
U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1
c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 1,000,000
c* – where the non-cancer screening level is < 100× cancer screening level
c** – where the non-cancer screening level < 10× cancer screening level

Table 6. Groundwater ingestion selected screening values (Illinois)

Analyte	CAS #	Selected Risk-Based Concentration: Groundwater Residential (µg/L)	Source	Comments for Selected Value	U.S. EPA 2009 Maximum Contaminant Level (µg/L)	IEPA 2007 TACO Remediation Objective, Class I Groundwater (µg/L)	U.S. EPA 2010 RSL Tapwater (µg/L)	IEPA 2009 Non-TACO Remediation Objective, Class I Groundwater (µg/L)
Semivolatile Organic Compounds								
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	83-32-9	420	TACO		--	420	2,200 n	--
Acenaphthylene	208-96-8	2,200 n	RSL	Used surrogate of Acenaphthene (83-32-9)	--	--	2,200 n	210
Anthracene	120-12-7	2,100	TACO		--	2,100	11,000 n	--
Benzo(a)anthracene	56-55-3	0.13 a	TACO		--	0.13 a	0.029 c	--
Benzo(a)pyrene	50-32-8	0.2 a,q	MCL/TACO		0.2	0.2 a,q	0.0029 c	--
Benzo(b)fluoranthene	205-99-2	0.18 a	TACO		--	0.18 a	0.029 c	--
Benzo(g,h,i)perylene	191-24-2	1,100 n	RSL	Used surrogate of Pyrene (129-00-0)	--	--	1,100 n	210
Benzo(k)fluoranthene	207-08-9	0.17 a	TACO		--	0.17 a	0.29 c	--
Chrysene	218-01-9	1.5 a	TACO		--	1.5 a	2.9 c	--
Dibenz(a,h)anthracene	53-70-3	0.3 a	TACO		--	0.3 a	0.0029 c	--
Fluoranthene	206-44-0	280	TACO		--	280	1,500 n	--
Fluorene	86-73-7	280	TACO		--	280	1,500 n	--
Indeno(1,2,3-cd)pyrene	193-39-5	0.43 a	TACO		--	0.43 a	0.029 c	--
2-Methylnaphthalene	91-57-6	150 n	RSL		--	--	150 n	--
Naphthalene (cancer)	91-20-3	140	TACO		--	140	0.14 c*	--
Naphthalene (non-cancer)	91-20-3	140	TACO	Used only IRIS-based non-cancer values	--	140	6.2 n	--
Phenanthrene	85-01-8	11,000 n	RSL	Used surrogate of Anthracene (120-12-7)	--	--	11,000 n	210
Pyrene	129-00-0	210	TACO		--	210	1,100 n	--
Phenols								
2,4-Dimethylphenol	105-67-9	140	TACO		--	140	730 n	--
2-Methylphenol (o-Cresol)	95-48-7	350	TACO		--	350	1,800 n	--
3&4-Methylphenol (m&p)	106-44-5	180 n	RSL	Used value for p-cresol (106-44-5)	--	--	180 n	35
Phenol	108-95-2	100 q	TACO		--	100 q	11,000 n	--
Volatile Organic Compounds								
Benzene	71-43-2	5 q	MCL/TACO		5	5 q	0.41 c	--
Ethylbenzene (cancer)	100-41-4	700 q	MCL/TACO		700	700 q	1.5 c	--
Ethylbenzene (non-cancer)	100-41-4	700 q	MCL/TACO	Used only IRIS-based non-cancer values	700	700 q	1,300 n	--
2-Methylnaphthalene	91-57-6	150 n	RSL		--	--	150 n	--
Toluene	108-88-3	1,000 q	MCL/TACO		1,000	1,000 q	2,300 n	--
1,2,4-Trimethylbenzene	95-63-6	15 n	RSL		--	--	15 n	--
1,3,5-Trimethylbenzene	108-67-8	370 n	RSL		--	--	370 n	350
m&p-Xylene	106-42-3	1,200 n	RSL	Used value for p-xylene (106-42-3)	--	--	1,200 n	--
o-Xylene	95-47-6	1,200 n	RSL		--	--	1,200 n	--
Xylene (Total)	1330-20-7	10,000 q	MCL/TACO		10,000	10,000 q	200 n	--
Aluminum	7429-90-5	37,000 n	RSL		--	--	37,000 n	3,500
Antimony	7440-36-0	6 q	MCL/TACO	Antimony (metallic)	6	6 q	15 n	--
Arsenic	7440-38-2	10	MCL	Arsenic, Inorganic	10	50 q	0.045 c	--
Barium	7440-39-3	2,000 q	MCL/TACO		2,000	2,000 q	7,300 n	--
Metals and Inorganics								
Cadmium	7440-43-9	5 q	MCL/TACO		5	5 q	18 n	--
Chromium	7440-47-3	100 q	MCL/TACO	Cr (total)	100	100 q	55,000 n	--
Copper	7440-50-8	650 q	TACO		1,300	650 q	1,500 n	--
Iron	7439-89-6	26,000 n	RSL		--	--	26,000 n	5,000
Lead	7439-92-1	7.5 q	TACO	Lead and Compounds	15	7.5 q	--	--
Manganese	7439-96-5	150 q	TACO	Used non-dietary value	--	150 q	880 n	--
Mercury	7487-94-7	2	MCL	Used Hg Chloride (& other Hg salts) (7487-94-7)	2	--	11 n	--
Nickel	7440-02-0	100 q	TACO	Nickel Soluble Salts	--	100 q	730 n	--
Selenium	7782-49-2	50 q	MCL/TACO		50	50 q	180 n	--
Silver	7440-22-4	50 q	TACO		--	50 q	180 n	--
Vanadium	7440-62-2	49	TACO	Used Vanadium and Compounds	--	49	180 n	--
Zinc	7440-66-6	5,000 q	TACO	Zinc (Metallic)	--	5,000 q	11,000 n	--
Cyanide	57-12-5	200 q	MCL/TACO	Cyanide (CN-)	200	200 q	730 n	--

(footnotes on following page)

Table 6. Groundwater ingestion selected screening values (Illinois)

Notes:
This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources that are described in the text. The source of the selected screening value is presented to the right of the numerical value.

Hierarchy for groundwater ingestion screening criteria:
Minimum of MCL or TACO Class I value, then RSL-tap water, then IL non-TACO groundwater remediation objective.
For the groundwater screening value, the notation of "MCL/TACO" indicates that both values were the same.

MCLs:
Maximum Contaminant Levels (MCL) national primary drinking water standards (U.S. EPA 2009) (http://water.epa.gov/drink/contaminants/index.cfm)

TACO and non-TACO
Illinois Tiered Approach to Corrective Action (TACO), groundwater remediation objectives, Title 35 Part 742 (IEPA 2007) (http://www.ipcb.state.il.us/SLR/IPCBandIEPAEnvironmentalRegulations-Title35.asp)
Illinois non-TACO objectives (IEPA 2009) (http://www.epa.state.il.us/land/taco/chemicals-not-in-taco-tier-1-tables.html)

RSLs
U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1
c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 1,000,000
c* – where the non-cancer screening level is < 100× cancer screening level
c** – where the non-cancer screening level < 10× cancer screening level
a – The groundwater remediation objective is equal to the Acceptable Detection Limit (ADL) for carcinogens according to the procedures specified in 35 Ill. Adm. Code 620.
q – Value listed is also the Groundwater Quality Standard for this chemical pursuant to 35 Ill. Adm. Code 620.410 for Class I Groundwater or 35 Ill. Adm. Code 620.420 for Class II Groundwater.

Table 7. Residential vapor intrusion screening values (Illinois & Wisconsin), 1×10^{-6} cancer risk

Analyte	CAS #	Selected Risk-Based Concentrations, Residential: Indoor Air RSL (µg/m³)		Shallow Soil Gas (µg/m³)	Deep Soil Gas (µg/m³)	Groundwater, Vapor Intrusion (µg/L)	Comments for Selected Value	U.S. EPA 2009 Maximum Contaminant Level (µg/L)
Semivolatile Organic Compounds								
Polycyclic Aromatic Hydrocarbons								
Naphthalene (cancer)	91-20-3	0.072 c*	RSL	0.72 c	7.2 c	4 c		--
Naphthalene (non-cancer)	91-20-3	3.1 n	RSL[a]	31 n	310 n	172 n	Used only IRIS-based non-cancer values	--
Volatile Organic Compounds								
Benzene	71-43-2	0.31 c	RSL	3.1 c	31 c	5 MCL		5
Ethylbenzene (cancer)	100-41-4	0.97 c	RSL	9.7 c	97 c	700 MCL		700
Ethylbenzene (non-cancer)	100-41-4	1,000 n	RSL[a]	10,000 n	100,000 n	3,100 n	Used only IRIS-based non-cancer values	700
Toluene	108-88-3	5,200 n	RSL	52,000 n	520,000 n	19,200 n		1,000
1,2,4-Trimethylbenzene	95-63-6	7.3 n	RSL	73 n	730 n	29 n		--
m&p-Xylene	106-42-3	730 n	RSL	7,300 n	73,000 n	2,590 n	Used value for p-xylene (106-42-3)	--
o-Xylene	95-47-6	730 n	RSL	7,300 n	73,000 n	3,450 n		--
Xylene (Total)	1330-20-7	100 n	RSL	1,000 n	10,000 n	10,000 MCL		10,000

Notes:

This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources and target risk that are described in the text and presented below. The source of the selected indoor air screening value is presented to the right of the numerical value. The vapor intrusion soil gas and groundwater screening values are based on the selected indoor air screening value as described in the hierarchy below. Only analytes that are sufficiently volatile and have available inhalation toxicity values are presented.

Hierarchy for vapor intrusion screening values:

Vapor intrusion (VI) screening values provided in EPA sources (U.S. EPA 2002) are out of date, and currently there are no IEPA screening values based on vapor intrusion. VI screening values for soil gas and groundwater were calculated using the most current U.S. EPA indoor air RSLs and using methods and default attenuation factors presented in U.S. EPA 2002. If the calculated groundwater VI value exceeded the MCL, then the MCL was used.

RSLs

U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

MCLs:

Maximum Contaminant Levels (MCL) national primary drinking water standards (U.S. EPA 2009) (http://water.epa.gov/drink/contaminants/index.cfm)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.

n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1

c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 1,000,000

c* – where the non-cancer screening level is < 100× cancer screening level

c** – where the non-cancer screening level < 10× cancer screening level

Table 8. Residential vapor intrusion screening values (Illinois & Wisconsin), 1×10^{-5} cancer risk

Analyte	CAS #	Selected Risk-Based Concentrations, Residential: Indoor Air RSL ($\mu g/m^3$)		Shallow Soil Gas ($\mu g/m^3$)	Deep Soil Gas ($\mu g/m^3$)	Groundwater, Vapor Intrusion ($\mu g/L$)	Comments for Selected Value	U.S. EPA 2009 Maximum Contaminant Level ($\mu g/L$)
Semivolatile Organic Compounds								
Polycyclic Aromatic Hydrocarbons								
Naphthalene (cancer)	91-20-3	0.72 c	RSL	7.2 c	72 c	40 c		--
Naphthalene (non-cancer)	91-20-3	3.1 n	RSL[a]	31 n	310 n	172 n	Used only IRIS-based non-cancer values	--
Volatile Organic Compounds								
Benzene	71-43-2	3.1 c	RSL	31 c	310 c	13.7 c		5
Ethylbenzene (cancer)	100-41-4	9.7 c	RSL	97 c	970 c	700 MCL		700
Ethylbenzene (non-cancer)	100-41-4	1,000 n	RSL[a]	10,000 n	100,000 n	3,100 n	Used only IRIS-based non-cancer values	700
Toluene	108-88-3	5,200 n	RSL	52,000 n	520,000 n	19,200 n		1,000
1,2,4-Trimethylbenzene	95-63-6	7.3 n	RSL	73 n	730 n	29 n		--
m&p-Xylene	106-42-3	730 n	RSL	7,300 n	73,000 n	2,590 n	Used value for p-xylene (106-42-3)	--
o-Xylene	95-47-6	730 n	RSL	7,300 n	73,000 n	3,450 n		--
Xylene (Total)	1330-20-7	100 n	RSL	1,000 n	10,000 n	10,000 MCL		10,000

Notes:

This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources and target risk that are described in the text and presented below. The source of the selected indoor air screening value is presented to the right of the numerical value. The vapor intrusion soil gas and groundwater screening values are based on the selected indoor air screening value as described in the hierarchy below. Only analytes that are sufficiently volatile and have available inhalation toxicity values are presented.

Hierarchy for vapor intrusion screening values:

Vapor intrusion (VI) screening values provided in EPA sources (U.S. EPA 2002) are out of date, and currently there are no IEPA screening values based on vapor intrusion.
VI screening values for soil gas and groundwater were calculated using the most current U.S. EPA indoor air RSLs and using methods and default attenuation factors presented in U.S. EPA 2002. If the calculated groundwater VI value exceeded the MCL, then the MCL was used.

RSLs

U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

MCLs:

Maximum Contaminant Levels (MCL) national primary drinking water standards (U.S. EPA 2009) (http://water.epa.gov/drink/contaminants/index.cfm)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.
n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1
c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 100,000

Table 9. Residential vapor intrusion screening values (Illinois & Wisconsin), 1×10^{-4} cancer risk

Analyte	CAS #	Selected Risk-Based Concentrations, Residential: Indoor Air RSL ($\mu g/m^3$)		Shallow Soil Gas ($\mu g/m^3$)	Deep Soil Gas ($\mu g/m^3$)	Groundwater, Vapor Intrusion ($\mu g/L$)	Comments for Selected Value	U.S. EPA 2009 Maximum Contaminant Level ($\mu g/L$)
Semivolatile Organic Compounds								
Polycyclic Aromatic Hydrocarbons								
Naphthalene (cancer)	91-20-3	3.1 n	RSL	31 n	310 n	172 n		--
Naphthalene (non-cancer)	91-20-3	3.1 n	RSL[a]	31 n	310 n	172 n	Used only IRIS-based non-cancer values	--
Volatile Organic Compounds								
Benzene	71-43-2	31 c	RSL	310 c	3,100 c	137 c		5
Ethylbenzene (cancer)	100-41-4	97 c	RSL	970 c	9,700 c	700 MCL		700
Ethylbenzene (non-cancer)	100-41-4	1,000 n	RSL[a]	10,000 n	100,000 n	3,100 n	Used only IRIS-based non-cancer values	700
Toluene	108-88-3	5,200 n	RSL	52,000 n	520,000 n	19,200 n		1,000
1,2,4-Trimethylbenzene	95-63-6	7.3 n	RSL	73 n	730 n	29 n		--
m&p-Xylene	106-42-3	730 n	RSL	7,300 n	73,000 n	2,590 n	Used value for p-xylene (106-42-3)	--
o-Xylene	95-47-6	730 n	RSL	7,300 n	73,000 n	3,450 n		--
Xylene (Total)	1330-20-7	100 n	RSL	1,000 n	10,000 n	10,000 MCL		10,000

Notes:

This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources and target risk that are described in the text and presented below. The source of the selected indoor air screening value is presented to the right of the numerical value. The vapor intrusion soil gas and groundwater screening values are based on the selected indoor air screening value as described in the hierarchy below. Only analytes that are sufficiently volatile and have available inhalation toxicity values are presented.

Hierarchy for vapor intrusion screening values:

Vapor intrusion (VI) screening values provided in EPA sources (U.S. EPA 2002) are out of date, and currently there are no IEPA screening values based on vapor intrusion. VI screening values for soil gas and groundwater were calculated using the most current U.S. EPA indoor air RSLs and using methods and default attenuation factors presented in U.S. EPA 2002. If the calculated groundwater VI value exceeded the MCL, then the MCL was used.

RSLs

U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

MCLs:

Maximum Contaminant Levels (MCL) national primary drinking water standards (U.S. EPA 2009) (http://water.epa.gov/drink/contaminants/index.cfm)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.

n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1

c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 10,000

Table 10. Industrial vapor intrusion screening values (Illinois & Wisconsin), 1×10^{-6} cancer risk

Analyte	CAS #	Selected Risk-Based Concentrations, Industrial: Indoor Air RSL ($\mu g/m^3$)		Shallow Soil Gas ($\mu g/m^3$)	Deep Soil Gas ($\mu g/m^3$)	Groundwater, Vapor Intrusion ($\mu g/L$)	Comments for Selected Value	U.S. EPA 2009 Maximum Contaminant Level ($\mu g/L$)
Semivolatile Organic Compounds								
Polycyclic Aromatic Hydrocarbons								
Naphthalene (cancer)	91-20-3	0.36 c*	RSL	3.6 c	36 c	20 c		--
Naphthalene (non-cancer)	91-20-3	13 n	RSL[a]	130 n	1,300 n	723 n	Used only IRIS-based non-cancer values	--
Volatile Organic Compounds								
Benzene	71-43-2	1.6 c*	RSL	16 c	160 c	7.05 c		5
Ethylbenzene (cancer)	100-41-4	4.9 c	RSL	49 c	490 c	700 MCL		700
Ethylbenzene (non-cancer)	100-41-4	4,400 n	RSL[a]	44,000 n	440,000 n	13,700 n	Used only IRIS-based non-cancer values	700
Toluene	108-88-3	22,000 n	RSL	220,000 n	2,200,000 n	81,000 n		1,000
1,2,4-Trimethylbenzene	95-63-6	31 n	RSL	310 n	3,100 n	123 n		--
m&p-Xylene	106-42-3	3,100 n	RSL	31,000 n	310,000 n	11,000 n	Used value for p-xylene (106-42-3)	--
o-Xylene	95-47-6	3,100 n	RSL	31,000 n	310,000 n	14,600 n		--
Xylene (Total)	1330-20-7	440 n	RSL	4,400 n	44,000 n	10,000 MCL		10,000

Notes:

This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources and target risk that are described in the text and presented below. The source of the selected indoor air screening value is presented to the right of the numerical value. The vapor intrusion soil gas and groundwater screening values are based on the selected indoor air screening value as described in the hierarchy below. Only analytes that are sufficiently volatile and have available inhalation toxicity values are presented.

Hierarchy for vapor intrusion screening values:

Vapor intrusion (VI) screening values provided in EPA sources (U.S. EPA 2002) are out of date, and currently there are no IEPA screening values based on vapor intrusion. VI screening values for soil gas and groundwater were calculated using the most current U.S. EPA indoor air RSLs and using methods and default attenuation factors presented in U.S. EPA 2002. If the calculated groundwater VI value exceeded the MCL, then the MCL was used.

RSLs

U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

MCLs:

Maximum Contaminant Levels (MCL) national primary drinking water standards (U.S. EPA 2009) (http://water.epa.gov/drink/contaminants/index.cfm)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.

n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1

c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 1,000,000

c* – where the non-cancer screening level is < 100× cancer screening level

c** – where the non-cancer screening level < 10× cancer screening level

Table 11. Industrial vapor intrusion screening values (Illinois & Wisconsin), 1×10^{-5} cancer risk

Analyte	CAS #	Selected Risk-Based Concentrations, Industrial: Indoor Air RSL ($\mu g/m^3$)		Shallow Soil Gas ($\mu g/m^3$)	Deep Soil Gas ($\mu g/m^3$)	Groundwater, Vapor Intrusion ($\mu g/L$)	Comments for Selected Value	U.S. EPA 2009 Maximum Contaminant Level ($\mu g/L$)
Semivolatile Organic Compounds								
Polycyclic Aromatic Hydrocarbons								
Naphthalene (cancer)	91-20-3	3.6 c	RSL	36 c	360 c	200 c		--
Naphthalene (non-cancer)	91-20-3	13 n	RSL[a]	130 n	1,300 n	723 n	Used only IRIS-based non-cancer values	--
Volatile Organic Compounds								
Benzene	71-43-2	16 c	RSL	160 c	1,600 c	70.5 c		5
Ethylbenzene (cancer)	100-41-4	49 c	RSL	490 c	4,900 c	700 MCL		700
Ethylbenzene (non-cancer)	100-41-4	4,400 n	RSL[a]	44,000 n	440,000 n	13,700 n	Used only IRIS-based non-cancer values	700
Toluene	108-88-3	22,000 n	RSL	220,000 n	2,200,000 n	81,000 n		1,000
1,2,4-Trimethylbenzene	95-63-6	31 n	RSL	310 n	3,100 n	123 n		--
m&p-Xylene	106-42-3	3,100 n	RSL	31,000 n	310,000 n	11,000 n	Used value for p-xylene (106-42-3)	--
o-Xylene	95-47-6	3,100 n	RSL	31,000 n	310,000 n	14,600 n		--
Xylene (Total)	1330-20-7	440 n	RSL	4,400 n	44,000 n	10,000 MCL		10,000

Notes:

This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources and target risk that are described in the text and presented below. The source of the selected indoor air screening value is presented to the right of the numerical value. The vapor intrusion soil gas and groundwater screening values are based on the selected indoor air screening value as described in the hierarchy below. Only analytes that are sufficiently volatile and have available inhalation toxicity values are presented.

Hierarchy for vapor intrusion screening values:

Vapor intrusion (VI) screening values provided in EPA sources (U.S. EPA 2002) are out of date, and currently there are no IEPA screening values based on vapor intrusion. VI screening values for soil gas and groundwater were calculated using the most current U.S. EPA indoor air RSLs and using methods and default attenuation factors presented in U.S. EPA 2002. If the calculated groundwater VI value exceeded the MCL, then the MCL was used.

RSLs

U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

MCLs:

Maximum Contaminant Levels (MCL) national primary drinking water standards (U.S. EPA 2009) (http://water.epa.gov/drink/contaminants/index.cfm)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.

n -- screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1

c -- screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 100,000

Table 12. Industrial vapor intrusion screening values (Illinois & Wisconsin), 1×10^{-4} cancer risk

Analyte	CAS #	Selected Risk-Based Concentrations, Industrial: Indoor Air RSL ($\mu g/m^3$)		Shallow Soil Gas ($\mu g/m^3$)	Deep Soil Gas ($\mu g/m^3$)	Groundwater, Vapor Intrusion ($\mu g/L$)	Comments for Selected Value	U.S. EPA 2009 Maximum Contaminant Level ($\mu g/L$)
Semivolatile Organic Compounds								
Polycyclic Aromatic Hydrocarbons								
Naphthalene (cancer)	91-20-3	13 n	RSL	130 n	1,300 n	723 n		--
Naphthalene (non-cancer)	91-20-3	13 n	RSL[a]	130 n	1,300 n	723 n	Used only IRIS-based non-cancer values	--
Volatile Organic Compounds								
Benzene	71-43-2	130 n	RSL	1,300 n	13,000 n	573 n		5
Ethylbenzene (cancer)	100-41-4	490 c	RSL	4,900 c	49,000 c	1,520 c		700
Ethylbenzene (non-cancer)	100-41-4	4,400 n	RSL[a]	44,000 n	440,000 n	13,700 n	Used only IRIS-based non-cancer values	700
Toluene	108-88-3	22,000 n	RSL	220,000 n	2,200,000 n	81,000 n		1,000
1,2,4-Trimethylbenzene	95-63-6	31 n	RSL	310 n	3,100 n	123 n		--
m&p-Xylene	106-42-3	3,100 n	RSL	31,000 n	310,000 n	11,000 n	Used value for p-xylene (106-42-3)	--
o-Xylene	95-47-6	3,100 n	RSL	31,000 n	310,000 n	14,600 n		--
Xylene (Total)	1330-20-7	440 n	RSL	4,400 n	44,000 n	10,000 MCL		10,000

Notes:

This table provides the selected screening value for each analyte based on a specific hierarchy of screening value sources and target risk that are described in the text and presented below. The source of the selected indoor air screening value is presented to the right of the numerical value. The vapor intrusion soil gas and groundwater screening values are based on the selected indoor air screening value as described in the hierarchy below. Only analytes that are sufficiently volatile and have available inhalation toxicity values are presented.

Hierarchy for vapor intrusion screening values:

Vapor intrusion (VI) screening values provided in EPA sources (U.S. EPA 2002) are out of date, and currently there are no IEPA screening values based on vapor intrusion. VI screening values for soil gas and groundwater were calculated using the most current U.S. EPA indoor air RSLs and using methods and default attenuation factors presented in U.S. EPA 2002. If the calculated groundwater VI value exceeded the MCL, then the MCL was used.

RSLs

U.S. EPA Regional Screening Levels (RSLs), updated November 2010 (http://www.epa.gov/region9/superfund/prg/)

MCLs:

Maximum Contaminant Levels (MCL) national primary drinking water standards (U.S. EPA 2009) (http://water.epa.gov/drink/contaminants/index.cfm)

[a] Screening value developed using non-cancer toxicity value presented in RSL table.

n – screening value based on non-cancer effects; calculated values correspond to a target hazard quotient of 1

c – screening value based on cancer effects; calculated values correspond to a cancer risk level of 1 in 10,000